WHAT IS CLAIMED IS:

1. A wavelength division multiplexing (WDM) hubbed ring network in which one central office is connected to a plurality of remote nodes by one optical transmission line, said network comprising:

said one central office, said one central office being configured for generating a high-priority optical signal and a low-priority optical signal at each wavelength corresponding to a channel in a first channel group, WDM-multiplexing high-priority optical signals and low-priority optical signals of respective channels in the first channel group, transmitting the multiplexed optical signals to each of the remote nodes in different directions ring-wise around said ring network by means of said one optical transmission line, and receiving from said remote nodes, at each wavelength corresponding to a channel in a second channel group and in respectively different directions ring-wise around said ring network, a high-priority optical signal and a low-priority optical signal ; and

said remote nodes, said remote nodes being configured for receiving from said central office by means of said one optical transmission line and in respectively different directions ring-wise around said ring network a high-priority optical signal and a low-priority optical signal at a common wavelength that corresponds to a respective channel in the first channel group, generating a high-priority optical signal and a low-priority optical signal at a common wavelength corresponding to any channel in the second channel group , and transmitting to the central office by means of said one optical transmission line and in respectively different directions ring-wise around said ring network the generated high-priority and low-priority optical signals at said

common wavelength corresponding to said any channel in the second channel group.

2. The WDM hubbed ring network of claim 1, wherein said central office comprises:

a plurality of light sources for generating a high-priority optical signal and a low-priority optical signal for each channel in the first channel group;

multiplexers for WDM-multiplexing the high-priority optical signal and the low-priority optical signal of each channel in the first channel group;

demultiplexers for demultiplexing a high-priority optical signal and a low-priority optical signal of each channel in the second channel group, transmitted bidirectionally from the optical transmission line; and

a plurality of receivers for receiving the demultiplexed high-priority optical signal and low-priority optical signal for each channel.

3. The WDM hubbed ring network of claim 2, wherein said central office further comprises:

first optical switches for setting a path to the multiplexers, according to priorities, for the high-priority optical signal and the low-priority optical signal of each channel in the first channel group from the light sources; and

second optical switches for setting a path to the receivers according to priorities, for the high-priority optical signal and the low-priority optical signal of each channel in the second channel group, transmitted bidirectionally from the optical transmission line.

4. The WDM hubbed ring network of claim 3, wherein said central office monitors presence/absence of a system failure by measuring for each channel the output created by the demultiplexer in the demultiplexing of said high-priority optical signal.

5. The WDM hubbed ring network of claim 4, wherein said central office comprises:

optical couplers each connected to an output terminal of each channel's optical signal from the demultiplexer for demultiplexing the high-priority optical signal in the second channel group, the optical coupler extracting a high-priority optical signal;

photo diodes connected to the associated optical couplers, for detecting optical power of each channel's optical signal; and

optical switch control circuits connected to the associated photo diodes, for simultaneously controlling the optical switches according to optical powers detected by the photo diodes.

6. The WDM hubbed ring network of claim 3, wherein the first optical switches are individually selectively actuatable to heal the network in response to topologically where on the ring network a break in the optical transmission line has occurred.

7. The WDM hubbed ring network of claim 6, wherein the healing preferentially provides for the first channel group a transmission path along the optical transmission line to a high-priority signal over its respective low-priority signal at said common wavelength.

8. The WDM hubbed ring network of claim 7, wherein the second optical switches are individually selectively actuatable to heal the network in response to topologically where on the ring network a break in the optical transmission line has occurred.

9. The WDM hubbed ring network of claim 8, wherein the healing preferentially provides for the second channel group a transmission path along the optical transmission line to a high-priority signal over its respective low-priority signal at said common wavelength.

10. The WDM hubbed ring network of claim 3, wherein the second optical switches are individually selectively actuatable to heal the network in response to topologically where on the ring network a break in the optical transmission line has occurred.

11. The WDM hubbed ring network of claim 10, wherein the healing preferentially provides for the second channel group a transmission path along the optical transmission line to a high-priority signal over its respective low-priority signal at said common wavelength.

12. The WDM hubbed ring network of claim 2, wherein the central office further comprises a circulator connected to the optical transmission line, for outputting the multiplexed optical signals in the first channel group from the multiplexers to the

optical transmission line, and outputting the optical signals in the second channel group, received from the optical transmission line, to the demultiplexers.

13. The WDM hubbed ring network of claim 1, wherein each of the remote nodes comprises:

light sources for generating, for a given channel in the second channel group, an optical signal having higher priority and an optical signal having lower priority;

a bidirectional add/drop multiplexer for dropping a high-priority optical signal and a low-priority optical signal of a given channel in the first channel group, transmitted from the optical transmission line, and adding to said optical transmission line the optical signals generated for said given channel in the second channel group; and

receivers for receiving the dropped optical signals.

14. The WDM hubbed ring network of claim 13, wherein each of the remote nodes further comprises an optical switch installed between the bidirectional add/drop multiplexer and said optical transmission line, for performing a switching operation so that in case of a system failure, the optical signal having higher priority can be recovered first.

15. The WDM hubbed ring network of claim 14, wherein each of the remote nodes monitors presence/absence of a system failure by measuring a high-priority optical signal of a channel in the first channel group, said optical signal of a channel in the first channel group having been transmitted from the optical transmission

line for said measuring.

16. The WDM hubbed ring network of claim 15, wherein each of the remote nodes comprises:

optical couplers each connected to the optical transmission line where a high-priority optical signal is received in a normal state, for extracting a high-priority optical signal;

a photo diode for detecting an optical power of a high-priority optical signal extracted by an optical coupler of said optical couplers; and

an optical switch control circuit connected to the photo diode, for controlling the optical switch of the respective remote node according the detected optical power.

17. The WDM hubbed ring network of claim 14, wherein the optical switch in each remote node comprises a 2×2 optical switch having two pairs of ports, each pair being, in said ring network, ring-wise on opposite sides of the bidirectional add/drop multiplexer, wherein the ports of one of the two pairs are connected in parallel to the ports of the other of the two pairs in a normal state, whereas the connections to the other of the two pairs of ports are reconfigured to swap respective sources from among said one of the two pairs in response to a system failure.

18. A central office of a wavelength division multiplexing (WDM) hubbed ring network in which one central office is connected to a plurality of remote nodes by one optical transmission line, said central office being configured for generating a high-priority optical signal and a low-priority optical signal at each wavelength corresponding to a channel in a first channel group, WDM-multiplexing high-priority optical signals and low-priority optical signals of respective channels in the first channel group, transmitting the multiplexed optical signals to each of the remote nodes in different directions ring-wise around said ring network by means of said one optical transmission line, and receiving from said remote nodes, at each wavelength corresponding to a channel in a second channel group and in respectively different directions ring-wise around said ring network, a high-priority optical signal and a low-priority optical signal.

19. A WDM hubbed ring network comprising the central office of claim 18, said network further comprising said remote nodes, said remote nodes being configured for receiving from said central office by means of said one optical transmission line and in respectively different directions ring-wise around said ring network a high-priority optical signal and a low-priority optical signal at a common wavelength that corresponds to a respective channel in the first channel group.

20. The WDM hubbed ring network of claim 19, said remote nodes being further configured for generating a high-priority optical signal and a low-priority optical signal at a common wavelength corresponding to any channel in the second channel group, and transmitting to the central office by means of said one optical transmission

line and in respectively different directions ring-wise around said ring network the generated high-priority and low-priority optical signals at said common wavelength corresponding to said any channel in the second channel group.

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